Colloquium

Avoiding technology-enhanced non-learning

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Introduction

The inclusion of digital technology into university teaching is now taken for granted as part of the landscape of higher education. Whilst there is enormous enthusiasm for the application of technology-enhanced learning (and considerable sums of money currently being spent on TEL initiatives), it is also clear from the literature that there has not been universal satisfaction in the past with the progress that has been made to integrate new technologies into teaching. This dissatisfaction has been due to the manner in which technological innovation has sometimes been introduced, or due to perceived barriers to the adoption of technology into existing teaching environments.

Clegg, Hudson and Steel (2003) described the introduction of e-learning as being driven by managerialist agendas. Watling (2009) goes on to comment on how managerialist pressure to participate in the digital revolution has encouraged the replication of traditional transmission models of teaching (a comment echoed by Mostert & Quinn, 2009). Whilst managers might push for the greater adoption of technology to enhance learning for the best of intentions, often encouraged by a technopositivist ideology (Njenga & Fourie, 2010), it is evident that where new technology has been forced into existing structures, it can result in the “domestication” of innovative technology (Salomon, 2002).

There is significant literature on the perceived barriers to the effective integration of ICT in teaching and learning environments (eg, Bingimlas, 2009; Pelgrum, 2001; Schneckenberg, 2009; Zemsky & Massy, 2004). These and other sources catalogue a number of issues. The main barriers can be summarized under the approximate headings of lack of confidence; lack of competence, and lack of access to resources (Bingimlas, 2009).

Undoubtedly, some of the concerns raised within the literature will diminish with time as mechanisms to overcome them are developed. Indeed, the “immediacy” of technology and its rapid pace of development may be in tension with the relatively slow pace of educational change. However, other concerns may be more systemic and require some work to overcome them. In particular, the integration of ICT discourses with the discourse of teaching is likely to occur relatively slowly as it requires dialogue between communities of practice (Hudson, 2009). Mostert and Quinn (2009) have noted that discourses on ICTs in higher education often act to separate ICTs from teaching and learning. This is emphasized in university policy documents where “teaching and learning strategies” are often published as separate documents from “e-learning strategies.”

The TPACK framework

In developing the TPACK framework (Technology, Pedagogy and Content Knowledge), Mishra and Koehler (2006); Koehler and Mishra (2009) have developed a useful tool for the consideration of the interaction of technology with content and with pedagogy, and may be helpful in overcoming
some of the barriers and difficulties described previously. A summary of the TPACK model is given in Figure 1. Koehler and Mishra (2009) discuss that the value of the TPACK model is helping to manage the complex and dynamic knowledge structures with which teachers have to interact in their professional practice: made more complex and less stable when trying to use new technologies in their teaching.

The integration suggested by the tight association of the elements depicted within the TPACK model may be more aspirational than real, and I offer two important factors to consider when looking at the TPACK model in practice:

1. The model appears to represent the three core components (Content, Pedagogy, Technology) as equal. However, when academic departments consider programme development, inevitably “content” is the driving force and takes up most of the developmental energy. Technology is then added to the mix (typically by those without an academic background in the content), whilst “pedagogy” is often tacitly presumed to somehow “be there.” The resulting asymmetry of the model in practice will then impact upon the student experience, such that many e-learning tools are seen to revert to a default “book” structure that masks the underlying knowledge structures and so gravitate towards a teacher-centred transmission mode of teaching (Alfano, Cuscino & Lenzitti, 2009).

2. The general misunderstanding of the term “pedagogy,” which is often taken as a synonym for teaching. However, teaching and pedagogy are structurally and functionally different (see Figure 2).
Like many areas of professional expertise, the work of professional educators consists in essence of two structural components: the experiential/linear component that embodies the practice that is used to identify and label professionals, and the conceptual/hierarchical component that provides the underlying theory that is continually drawn upon by those professionals to guide them in the evolution of practice (see Kinchin & Cabot, 2010). For the university lecturer, these can be conveniently given the shorthand of “teaching” and “pedagogy” (see Figure 2). Whilst the teaching is visible, the underlying pedagogy may less apparent. It is, however, the pedagogy (composed of values, beliefs, theories and assumptions) that drives teaching and not vice versa. Clegg et al (2003) have commented that “ICTs as artifacts and social processes are already inscribed with gendered assumptions.” And so, as clearly stated by Kinchin (2012), “pedagogy cannot be added to e-learning materials as an after-thought as the implicit values and beliefs required to construct a pedagogy will already inhabit the digital media, and will underpin the pedagogic discourse that inevitably pre-empts the linear discourse of teaching methods.” So when I am told by an e-learning technologist unveiling a new e-learning package that, “the pedagogy will come later,” I can see that comments by Mishra and Koehler (2006) about technologists and teachers having different perspectives on the pedagogy and the technology were spot on. Indeed, Hudson (2009, p. 226) goes further in describing disappointing levels of collaboration between educational developers and learning technologists leading to “competitive struggles” between the two, resulting in separate working practices and occasional “attempts by one group to marginalise the other.”

Clegg et al (2003) called for the development of a critical pedagogy approach that “re-focuses attention away from the functionality of e-learning environments back to the core relations between
students and teachers,” whilst others have called for a greater focus on learner-centred design (eg, Harris, Mishra & Koehler, 2009; Penna & Stara, 2007). This can be interpreted as a need to pay greater attention to the pedagogy that underpins teaching practice (Figure 2), whether or not it is “technology-enhanced.”

Knowledge structures and TPACK

In traditional university teaching situations where undue attention is paid to the transmission of linear components of a subject, the learning that follows is characterized by an acquisition of information without any parallel development in understanding. This has been termed “non-learning” (Kinchin, Lygo-Baker & Hay, 2008b), and is typical of content-led teaching modes. In order to attain meaningful learning, the linear chains of information need to be underpinned by complementary networks of understanding. It is the movement between these knowledge structures that confers deep understanding, and eventual expertise (Kinchin & Cabot, 2010).

By transposing this dual-processing concept of expertise onto the TPACK framework, it can be anticipated that the elements within the model (content, teaching and pedagogy) may each have their own chain of practice that will be observable to colleagues who occupy the other sectors of the model. However, colleagues in other sectors may not be aware of the underlying networks of understanding that support that practice. And if, as suggested above, the sectors of the model are unequal, there is likely to be most interaction between content and technology (brought to the fore by teachers and technologists); the pedagogy will be sidelined as it lies outside traditional non-learning discourses (Kinchin, 2012). However, unless the underlying knowledge from the pedagogy sector is shared (often through the intervention of academic developers), there is likely to be a simple exchange of linear knowledge chains (within the TCK sector) that can only result in “technology-enhanced non-learning.”

To avoid the slide towards non-learning (as described by Kinchin et al., 2008b) it is necessary to look beyond the visible chains of practice that define the surface characteristics of each TPACK element (Figure 3). Just as “teaching” may obscure its underlying “pedagogy”, a second less public layer of understanding can be found for each of the sections. The public discourses of educational technologists and of disciplinary content specialists will also obscure the deep knowledge held by experts in those areas.

The consideration of conceptual structures has been shown to be a powerful way of considering the relationship between discipline, curriculum and student understanding in order to allow the manipulation of multiple representations of knowledge (eg, Kinchin, 2011). So too, revealing the structural characteristics of TPACK components provides a route into “engagement with the rich problems of pedagogy, technology and content and their inter-relationships ... seeking to construct new ways of seeing the world, and new approaches to using technology, in order to develop creative pedagogical solutions.” This has been defined by Koehler et al (2011, p. 154) as “deep play.” Such deep play allows educators to repurpose software for educational use and to raise the profile of the underlying pedagogy (Kinchin, Chadha & Kokotailo, 2008a), and even to revise content knowledge (Polly, 2011) in ways that are unlikely to be achieved through short workshops and decontextualized seminars (Brand, 1997).

Conclusion

When the pedagogy that underpins TEL is considered as a partner to technology and content in the design of new resources, it is vital that the distinction is made between the apparent linear practice of teachers and the network of understanding that underpins that practice—the pedagogy. The interplay between the linear chains of practice and the hierarchical networks of understanding constitutes the site of expertise (Kinchin & Cabot, 2010). It is, therefore, vital to expose
both components of expertise. When only the linear chains of practice are considered, then the inevitable consequence is non-learning (Kinchin et al., 2008b). When this occurs in the design of digital learning resources, it may be termed technology-enhanced non-learning. The key to avoiding a non-learning outcome is effective communication between communities (teachers, technologists and academic developers) which inhabit the individual arenas within the TPACK framework by exploring the “horizontal plane” across the explicit upper level of the TPACK model, and through engagement in deep play which involves digging “vertically” into the lower level of the model.

References


